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## SEQUENCE LISTING

<110> Hogrefe, Holly

Hansen, Connie J

<120> Polymerase Enhancing Factor (PEF) Extracts, PEF Protein Complexes, Isolated PEF Proteins, and Methods for Purifying and Identifying

<130> 4121.0116-02

<140> US 09/399,003

<141> 1999-09-20

<150> PCT/ US98/05497

<151> 1998-03-20

<150> US 08/957,709

<151> 1997-10-24

<150> US 08/822,774

<151> 1997-03-21

<160> 89

<170> PatentIn version 3.1

<210> 1

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Xaa Xaa Leu His His Val Lys Leu Ile Tyr Ala Thr Xaa Xaa Xaa  
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Xaa Xaa Xaa Pro Asp Trp Xaa Xaa Arg Xaa Glu Xaa Leu Xaa Xaa  
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<210> 3

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Xaa Leu Leu His His Val Lys Leu Ile Tyr Ala Thr Lys Xaa Arg Xaa  
1 5 10 15

Leu Val Gly Lys Xaa Ile Val Leu Ala Ile Pro Gly Xaa Xaa Ala Xaa  
20 25 30

Xaa Xaa Xaa  
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Xaa Xaa Xaa Pro Asp Trp Xaa Xaa Arg Xaa Glu Xaa Leu Xaa Glu Xaa  
1 5 10 15

Xaa Xaa

<210> 5

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<222> (1)..(17)

<223> "X" represents any amino acid

<400> 5

Xaa Tyr Asp Ala Val Ile Met Ala Ala Val Val Asp Phe Arg Pro  
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Lys

<210> 6

<211> 24

<212> PRT

<213> Pyrococcus furiosus

<400> 6

Ala Asp Leu Val Val Gly Asn Thr Leu Glu Ala Phe Gly Ser Glu Glu  
1 5 10 15

Asn Gln Val Val Leu Ile Gly Arg  
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<222> (1)..(17)

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Gly Ala Met Leu His His Val Lys Leu Ile Tyr Ala Xaa Lys Leu Arg  
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Lys

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Gly Ala Met Leu His His Val Lys Leu Ile Tyr Ala Thr Lys Xaa Xaa  
1 5 10 15

Arg Lys

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Met Leu His His Val Lys Leu Ile Tyr Ala Thr Lys Leu  
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<222> (1)..(16)

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Gly Xaa Xaa Xaa Pro Asp Trp Xaa Xaa Lys Phe Arg Lys Glu Glu Ser  
1 5 10 15

<210> 11

<211> 17

<212> PRT

<213> Pyrococcus furiosus

<400> 11

Gly Ala Ile Leu Leu Pro Asp Trp Lys Ile Arg Lys Glu Ile Leu Ile  
1 5 10 15

Glu

<210> 12

<211> 16

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<222> (1)..(16)

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Xaa Met His His Val Ile Lys Leu Xaa Tyr Ala Thr Xaa Ser Arg Lys  
1 5 10 15

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<211> 18

<212> PRT

<213> Pyrococcus furiosus

<400> 13

Met Leu Tyr Leu Val Arg Pro Asp Trp Lys Arg Arg Lys Glu Ile Leu  
1 5 10 15

Ile Glu

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caycaygaha arythattta cgc

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caycaygaha arythatata cgc

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 ardacdacyt grttttcttc

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 attaggcatg gggccgaagt tcatgcagt atgagtgagg cagccacca gataattcat 180  
 ccttatgcat ggaatttgcc cacgggaaat ccagtcataa ctgagatcac tggatttatc 240  
 gagcatgttg agttagcagg ggaacatgag aataaagcag atttaatttt ggtttgcct 300  
 gccactgcca acacaattag taagattgca tgtggaatag atgatactcc agtaactaca 360  
 gtcgtgacca cagcatttcc ccacattcca attatgatag cccagcaat gcatgagaca 420  
 atgtacaggc atcccatagt aaggggagaac attgaaaggt taaagaagct tggcgttgag 480  
 tttataggac caagaattga ggagggaaag gcaaaagttg caagcattga tgaaatagtt 540  
 tacagagtta ttaaaaagct ccacaaaaaa acattggaag ggaagagagt cctagtaacg 600  
 gcgggagcaa caagagagta catagatcca ataagattca taacaaatgc cagcagtgga 660  
 aaaatgggag tagcgttggc tgaagaagca gattttagag gagctgttac cctcataaga 720

acaaagggaa gtgtaaaggc ttttagaatc agaaaaatca aattgaaggt tgagacagtg 780  
 gaagaaatgc tttcagcgat tgaaaatgag ttgaggagta aaaagtatga cgtagttatt 840  
 atggcagctg ctgtaagcga ttttagggcca aaaattaaag cagaggggaaa aattaaaagc 900  
 ggaagatcaa taacgataga gctcgttccn nnnaatccca aaatcattga tagaataaag 960  
 gaaattcaac caaatgtctt tcttgttgga tttaaagcag aaacttcaaa agaaaagctt 1020  
 atagaagaag gtaaaaggca gattgagagg gccaaaggctg acttagtcgt tggtaacaca 1080  
 ttggaagcct ttggaagcga ggaaaaccaa gtagtattaa ttggcagaga tttcacaaaa 1140  
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Met Leu His His Val Lys Leu Ile Tyr Ala Thr Lys Ser Arg Lys Leu  
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Val Gly Lys Lys Ile Val Xaa Xaa Xaa Pro Gly Ser Ile Ala Ala Leu  
 20 25 30

Asp Val Lys Ala Cys Glu Gly Leu Ile Arg His Gly Ala Glu Val His  
 35 40 45

Ala Val Met Ser Glu Ala Ala Thr Lys Ile Ile His Pro Tyr Ala Trp  
 50 55 60

Asn Leu Pro Thr Gly Asn Pro Val Ile Thr Glu Ile Thr Gly Phe Ile  
 65 70 75 80

Glu His Val Glu Leu Ala Gly Glu His Glu Asn Lys Ala Asp Leu Ile  
 85 90 95

Leu Val Cys Pro Ala Thr Ala Asn Thr Ile Ser Lys Ile Ala Cys Gly  
100 105 110

Ile Asp Asp Thr Pro Val Thr Thr Val Val Thr Thr Ala Phe Pro His  
115 120 125

Ile Pro Ile Met Ile Ala Pro Ala Met His Glu Thr Met Tyr Arg His  
130 135 140

Pro Ile Val Arg Glu Asn Ile Glu Arg Leu Lys Lys Leu Gly Val Glu  
145 150 155 160

Phe Ile Gly Pro Arg Ile Glu Glu Gly Arg Ala Lys Val Ala Ser Ile  
165 170 175

Asp Glu Ile Val Tyr Arg Val Ile Lys Lys Leu His Lys Lys Thr Leu  
180 185 190

Glu Gly Lys Arg Val Leu Val Thr Ala Gly Ala Thr Arg Glu Tyr Ile  
195 200 205

Asp Pro Ile Arg Phe Ile Thr Asn Ala Ser Ser Gly Lys Met Gly Val  
210 215 220

Ala Leu Ala Glu Glu Ala Asp Phe Arg Gly Ala Val Thr Leu Ile Arg  
225 230 235 240

Thr Lys Gly Ser Val Lys Ala Phe Arg Ile Arg Lys Ile Lys Leu Lys  
245 250 255

Val Glu Thr Val Glu Glu Met Leu Ser Ala Ile Glu Asn Glu Leu Arg  
260 265 270

Ser Lys Lys Tyr Asp Val Val Ile Met Ala Ala Ala Val Ser Asp Phe  
275 280 285

Arg Pro Lys Ile Lys Ala Glu Gly Lys Ile Lys Ser Gly Arg Ser Ile  
290 295 300

Thr Ile Glu Leu Val Pro Xaa Asn Pro Lys Ile Ile Asp Arg Ile Lys  
305 310 315 320

Glu Ile Gln Pro Asn Val Phe Leu Val Gly Phe Lys Ala Glu Thr Ser  
325 330 335

Lys Glu Lys Leu Ile Glu Glu Gly Lys Arg Gln Ile Glu Arg Ala Lys  
340 345 350

Ala Asp Leu Val Val Gly Asn Thr Leu Glu Ala Phe Gly Ser Glu Glu  
355 360 365

Asn Gln Val Val Leu Ile Gly Arg Asp Phe Thr Lys Glu Leu Pro Lys  
370 375 380

Met Lys Lys Arg Glu Leu Ala Glu Arg Ile Trp Asp Glu Ile Glu Lys  
385 390 395 400

Xaa Leu Ser

<210> 20

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actacggaat tccacggaaa atgccgctca tcc

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ggcgtttccg ttcttcttcg

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ccatctcacg cgccagtttc

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gaggagagca ggaaaggtgg aac

23

<210> 25

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gctgggagaa gacttcactg g

21

<210> 26

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<400> 26  
gagcttgctc aactttatc

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<400> 27  
gatagagata gtttctggag acg

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<210> 28

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<400> 28  
cgggatatcg acatttctgc acc

23

<210> 29

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<400> 29  
gagttaaagt cctacactgt atct

24

<210> 30

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<212> DNA

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<400> 30  
caggactcag aagctgctat cgaa

24

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<400> 31  
ctgcacgtgc cctgtaggat ttgt

24

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<223> "n" is a, t, g, or c

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ccagaytgga arwknaggaa aga

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ccagaytgga arwknagaaa aga

23

<210> 34

<211> 23

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ccagaytgga arwknaggaa gga

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<210> 35

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<223> "n" is a, t, g, or c

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ccagaytgga arwknagaaa gga

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<211> 84

<212> DNA

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cagagtgggc agagaggctn ttgttaaggg gaaattaatc gacgtggaaa aggaaggaaa

60

agtcgntatt cctccaaggg aata

84

<210> 37

<211> 27

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<213> Pyrococcus furiosus

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<222> (1)..(27)

<223> "X" represents any amino acid

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Glu Trp Ala Glu Arg Leu Leu Leu Arg Gly Asn Xaa Ser Lys Trp Lys  
1 5 10 15

Arg Lys Glu Lys Ser Xaa Phe Leu Gln Gly Asn  
20 25

<210> 38

<211> 27

<212> PRT

<213> Pyrococcus furiosus

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<221> MISC\_FEATURE

<222> (1)..(27)

<223> "X" represents any amino acid

<400> 38

Arg Val Gly Arg Glu Ala Xaa Val Lys Gly Lys Leu Ile Glu Val Glu  
1 5 10 15

Lys Glu Gly Lys Val Xaa Ile Pro Pro Arg Glu  
20 25

<210> 39

<211> 28

<212> PRT

<213> Pyrococcus furiosus

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<222> (1)..(28)

<223> "X" represents any amino acid

<400> 39

Gln Ser Gly Gln Arg Gly Xaa Cys Xaa Gly Glu Ile Asn Arg Ser Gly  
1 5 10 15

Lys Gly Arg Lys Ser Arg Tyr Ser Ser Lys Gly Leu  
20 25

<210> 40

<211> 129

<212> DNA

<213> Pyrococcus furiosus

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agtatttctt ttctgatttt ccagtctgga agtagcattt taccaccgaa acctttattt 120  
ttaatttaa 129

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<211> 42

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<222> (1)..(42)

<223> "X" represents any amino acid

<400> 41

Xaa Ile Lys Asn Lys Gly Phe Gly Gly Lys Met Leu Leu Pro Asp Trp  
1 5 10 15

Lys Ile Arg Lys Glu Ile Leu Ile Glu Pro Phe Ser Glu Glu Trp Leu  
20 25 30

Gln Pro Ala Gly Tyr Asp Leu Arg Val Gly  
35 40

<210> 42  
 <211> 740  
 <212> DNA  
 <213> Pyrococcus furiosus

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 <221> misc\_feature  
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 tatgggggat atgaagataa ggagcagttt agcaagagaa ggggttattg gttcttttgc 120  
 ttgggttgac ccaggatggg atggaaactt aacactaatg ctctacaatg cctcaaatga 180  
 acctgtcgaa ttaagatatg gagagagatt tgtgcagatc gcatttataa ggctagaggg 240  
 tccggcaaga aacccttaca gaggaaacta tcaggggagc acaaggttag cgttttcaaa 300  
 gagaaagaaa ctctagcgtc ttttcaatag catcctcaat atctcgtgtg aagtaatcaa 360  
 tgtaaatact tgctgggttg gtttttaggg attcaaactc gtaagatggg cctgtatagc 420  
 agaaaactat ttttgcctct tcttcattta tctttctgtg aataaaaaat ccaacatcca 480  
 cactagtttc aaaagatatt gtttgcgtga ttaccaacaa gatcttggca ttatttttga 540  
 tcttatactc tatttctcctt tctccctcca atttgcccaa aataaacctg ggtagtatac 600  
 attcactcct ctctttttaa ttctataaaa ttctgtacata gtttagaaaa atgtcaaatt 660  
 cttntttccc tgttaaatta accncnaaat ctttatnann aancctttta taattcccaa 720  
 aaccctaat tttccccttn 740

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<400> 43

Leu Gln Gly Asn Thr Pro Xaa Ser Xaa Pro Ser Arg Gly Xaa Ser Cys  
1 5 10 15

Pro Thr Met Leu Trp Gly Ile Xaa Arg Xaa Gly Ala Val Xaa Gln Glu  
20 25 30

Lys Gly Leu Leu Val Leu Leu Leu Gly Leu Thr Gln Asp Gly Met Glu  
35 40 45

Thr Xaa His Xaa Cys Ser Thr Met Pro Gln Met Asn Leu Ser Asn Xaa  
50 55 60

Asp Met Glu Arg Asp Leu Cys Arg Ser His Leu Xaa Gly Xaa Arg Val  
65 70 75 80

Arg Gln Glu Thr Leu Thr Glu Glu Thr Ile Arg Gly Ala Gln Gly Xaa  
85 90 95

Arg Phe Gln Arg Glu Arg Asn Ser Ser Val Phe Ser Ile Ala Ser Ser  
100 105 110

Ile Ser Arg Val Lys Xaa Ser Met Xaa Ile Leu Ala Gly Trp Val Phe  
115 120 125

Arg Asp Ser Asn Ser Xaa Asp Gly Pro Val Xaa Gln Lys Thr Ile Phe  
130 135 140

Ala Ser Ser Ser Phe Ile Phe Leu Xaa Ile Lys Asn Pro Thr Ser Thr  
145 150 155 160

Leu Val Pro Lys Asp Ile Val Cys Val Ile Thr Asn Lys Ile Leu Ala  
165 170 175

Leu Phe Leu Ile Leu Tyr Ser Ile Leu Leu Ser Pro Ser Asn Leu Pro  
180 185 190

Lys Ile Asn Leu Gly Ser Ile His Ser Leu Leu Ser Phe Lys Phe Leu  
195 200 205

Xaa Ile Arg Thr Xaa Phe Arg Lys Met Ser Asn Ser Xaa Phe Pro Val  
210 215 220

Lys Leu Thr Xaa Lys Ser Leu Xaa Xaa Xaa Phe Leu Xaa Phe Pro Lys

225 230 235 240

Pro Leu Ile Phe Pro Xaa  
245

<210> 44

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<213> Pyrococcus furiosus

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<222> (1)..(246)

<223> "X" represents any amino acid

<400> 44

Pro Pro Arg Glu Tyr Ala Leu Ile Leu Thr Leu Glu Arg Ile Lys Leu  
1 5 10 15

Pro Asn Asn Val Met Gly Asp Met Lys Ile Arg Ser Ser Leu Ala Arg  
20 25 30

Glu Gly Val Ile Gly Ser Phe Ala Trp Val Asp Pro Gly Trp Asp Gly  
35 40 45

Asn Leu Thr Leu Met Leu Tyr Asn Ala Ser Asn Glu Pro Val Glu Leu  
50 55 60

Arg Tyr Gly Glu Arg Phe Val Gln Ile Ala Phe Ile Arg Leu Glu Gly  
65 70 75 80

Pro Ala Arg Asn Pro Tyr Arg Gly Asn Tyr Gln Gly Ser Thr Arg Leu  
85 90 95

Ala Phe Ser Lys Arg Lys Lys Leu Xaa Arg Leu Phe Asn Ser Ile Leu  
100 105 110

Asn Ile Ser Cys Glu Val Ile Asn Val Asn Thr Cys Trp Val Gly Phe  
115 120 125

Xaa Gly Phe Lys Leu Val Arg Trp Ala Cys Ile Ala Glu Asn Tyr Phe  
130 135 140

Cys Leu Phe Phe Ile Tyr Leu Ser Val Asn Lys Lys Ser Asn Ile His  
145 150 155 160

Thr Ser Ser Lys Arg Tyr Cys Leu Arg Asp Tyr Gln Gln Asp Leu Gly  
165 170 175

Ile Ile Phe Asp Leu Ile Leu Tyr Ser Pro Phe Ser Leu Gln Phe Ala  
180 185 190

Gln Asn Lys Pro Gly Xaa Tyr Thr Phe Thr Pro Leu Phe Xaa Ile Pro  
195 200 205

Ile Asn Ser Tyr Ile Val Xaa Lys Asn Val Lys Phe Phe Xaa Pro Cys  
210 215 220

Xaa Ile Asn Xaa Xaa Ile Phe Xaa Xaa Xaa Leu Phe Ile Ile Pro Lys  
225 230 235 240

Thr Pro Asn Phe Pro Leu  
245

<210> 45

<211> 246

<212> PRT

<213> Pyrococcus furiosus

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<222> (1)..(246)

<223> "X" represents any amino acid

<400> 45

Ser Ser Lys Gly Ile Arg Leu Asn Pro Asn Pro Arg Glu Asp Lys Val  
1 5 10 15

Ala Arg Arg Cys Tyr Gly Gly Tyr Glu Asp Lys Glu Gln Phe Ser Lys  
20 25 30

Arg Arg Gly Tyr Trp Phe Phe Cys Leu Gly Xaa Pro Arg Met Gly Trp  
35 40 45

Lys Leu Asn Thr Asn Ala Leu Gln Cys Leu Lys Xaa Thr Cys Arg Ile  
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50

55

60

Lys Ile Trp Arg Glu Ile Cys Ala Asp Arg Ile Tyr Lys Ala Arg Gly  
65 70 75 80

Ser Gly Lys Lys Pro Leu Gln Arg Lys Leu Ser Gly Glu His Lys Val  
85 90 95

Ser Val Phe Lys Glu Lys Glu Thr Leu Ala Ser Phe Gln Xaa His Pro  
100 105 110

Gln Tyr Leu Val Xaa Ser Asn Gln Cys Lys Tyr Leu Leu Gly Gly Phe  
115 120 125

Leu Gly Ile Gln Thr Arg Lys Met Gly Leu Tyr Ser Arg Lys Leu Phe  
130 135 140

Leu Pro Leu Leu His Leu Ser Phe Cys Glu Xaa Lys Ile Gln His Pro  
145 150 155 160

His Xaa Phe Gln Lys Ile Leu Phe Ala Xaa Leu Pro Thr Arg Ser Trp  
165 170 175

His Tyr Phe Xaa Ser Tyr Thr Leu Phe Ser Phe Leu Pro Pro Ile Cys  
180 185 190

Pro Lys Xaa Thr Trp Val Val Tyr Ile His Ser Ser Leu Leu Asn Ser  
195 200 205

Tyr Lys Phe Val His Ser Leu Glu Lys Cys Gln Ile Leu Xaa Ser Leu  
210 215 220

Leu Asn Xaa Pro Xaa Asn Leu Tyr Xaa Xaa Xaa Phe Tyr Asn Ser Gln  
225 230 235 240

Asn Pro Xaa Phe Ser Pro  
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<210> 46

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<222> (1)..(31)

<223> "x" represents any amino acid

<400> 46

Met Leu His His Val Lys Leu Ile Tyr Ala Thr Lys Ser Arg Lys Leu  
1 5 10 15

Val Gly Lys Lys Ile Val Xaa Xaa Xaa Pro Gly Ser Ile Ala Ala  
20 25 30

<210> 47

<211> 17

<212> PRT

<213> *Pyrococcus furiosus*

<400> 47

Lys Tyr Asp Val Val Ile Met Ala Ala Ala Val Ser Asp Phe Arg Phe  
1 5 10 15

Lys

<210> 48

<211> 24

<212> PRT

<213> *Pyrococcus furiosus*

<400> 48

Ala Asp Leu Val Val Gly Asn Thr Leu Glu Ala Phe Gly Ser Glu Glu  
1 5 10 15

Asn Gln Val Val Leu Ile Gly Arg  
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<210> 49

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<212> DNA

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ctattgagta cgaacgccat c

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<223> synthetic

<400> 50

gtcacgcttg ctccactccg

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<210> 51

<211> 437

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC\_FEATURE

<222> (1)..(437)

<223> "x" represents any amino acid

<400> 51

Met Ile Ser Glu Ile Met His Pro Thr Lys Leu Leu Lys Gly Thr Lys  
1 5 10 15

Ser Lys Leu Leu Glu Asn Lys Lys Ile Leu Val Ala Val Thr Ser Ser  
20 25 30

Ile Ala Ala Ile Glu Thr Pro Lys Leu Met Arg Glu Leu Ile Arg His  
35 40 45

Gly Ala Glu Val Tyr Cys Ile Ile Thr Glu Glu Thr Lys Lys Ile Ile  
Page 25

50

55

60

Gly Lys Glu Ala Leu Lys Phe Gly Cys Gly Asn Glu Val Tyr Glu Glu  
65 70 75 80

Ile Thr Gly Xaa Xaa Xaa Xaa Xaa Asp Ile Glu His Ile Leu Leu Tyr  
85 90 95

Xaa Xaa Xaa Xaa Asn Glu Cys Asp Cys Leu Leu Ile Tyr Pro Ala Thr  
100 105 110

Ala Asn Ile Ile Ser Lys Ile Asn Leu Gly Ile Ala Asp Asn Ile Val  
115 120 125

Asn Thr Thr Ala Leu Met Phe Phe Gly Asn Lys Pro Ile Phe Ile Val  
130 135 140

Pro Ala Met His Glu Asn Met Phe Asn Xaa Xaa Ala Ile Lys Arg His  
145 150 155 160

Ile Asp Lys Leu Lys Glu Lys Asp Lys Ile Tyr Ile Ile Ser Pro Lys  
165 170 175

Phe Glu Glu Xaa Xaa Xaa Xaa Xaa Xaa Gly Lys Ala Lys Val Ala Asn  
180 185 190

Ile Glu Asp Val Val Lys Ala Val Ile Glu Lys Ile Gly Asn Asn Leu  
195 200 205

Lys Lys Glu Gly Asn Arg Val Leu Ile Leu Asn Gly Gly Thr Val Glu  
210 215 220

Phe Ile Asp Lys Val Arg Val Ile Ser Asn Leu Ser Ser Gly Lys Met  
225 230 235 240

Gly Val Ala Leu Ala Glu Ala Phe Cys Lys Glu Gly Phe Tyr Val Glu  
245 250 255

Val Ile Thr Ala Met Gly Leu Glu Pro Pro Tyr Tyr Ile Lys Asn His  
260 265 270

Lys Val Leu Thr Ala Lys Glu Met Leu Asn Lys Ala Ile Glu Xaa Xaa  
275 280 285

Leu Xaa Ala Lys Asp Phe Asp Ile Ile Ile Ser Ser Ala Ala Ile Ser  
290 295 300

Asp Phe Thr Val Glu Ser Xaa Phe Glu Gly Lys Leu Ser Ser Glu Glu  
Page 26

305                      310                      315                      320  
 Glu Xaa Xaa Xaa Xaa Leu Ile Leu Lys Leu Lys Arg Xaa Asn Pro Lys  
                                  325                      330                      335  
 Val Leu Glu Glu Leu Arg Arg Ile Tyr Lys Asp Xaa Lys Val Ile Ile  
                                  340                      345                      350  
 Gly Phe Lys Ala Glu Tyr Asn Leu Asp Glu Lys Glu Leu Ile Asn Arg  
                                  355                      360                      365  
 Ala Lys Glu Arg Leu Asn Lys Tyr Asn Leu Asn Met Ile Ile Ala Asn  
                                  370                      375                      380  
 Asp Leu Ser Lys Xaa Xaa His Tyr Phe Gly Asp Asp Tyr Ile Glu Val  
                                  385                      390                      395                      400  
 Tyr Ile Ile Thr Lys Tyr Glu Val Glu Lys Ile Ser Gly Ser Lys Lys  
                                  405                      410                      415  
 Xaa Glu Ile Ser Glu Arg Ile Val Glu Lys Val Lys Lys Leu Val Lys  
                                  420                      425                      430  
 Ser Xaa Xaa Xaa Xaa  
                                  435

<210> 52

<211> 444

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC\_FEATURE

<222> (1)..(444)

<223> "X" represents any amino acid

<400> 52

Met Lys Ala Arg Gln Gln Lys Tyr Cys Asp Lys Ile Ala Asn Phe Trp  
 1                      5                      10                      15  
 Cys His Pro Thr Gly Lys Ile Ile Met Ser Leu Ala Gly Lys Lys Ile  
                                  20                      25                      30

Val Leu Gly Val Ser Gly Gly Ile Ala Ala Tyr Lys Thr Pro Glu Leu  
35 40 45

Val Arg Arg Leu Arg Asp Arg Gly Ala Asp Val Arg Val Ala Met Thr  
50 55 60

Glu Ala Ala Lys Ala Phe Ile Thr Pro Leu Ser Leu Gln Ala Val Ser  
65 70 75 80

Gly Tyr Pro Val Ser Asp Ser Leu Leu Asp Pro Ala Ala Glu Ala Ala  
85 90 95

Met Gly His Ile Glu Leu Gly Xaa Xaa Xaa Xaa Lys Trp Ala Asp Leu  
100 105 110

Val Ile Leu Ala Pro Ala Thr Ala Asp Leu Ile Ala Arg Val Ala Ala  
115 120 125

Gly Met Ala Asn Asp Leu Val Ser Thr Ile Cys Leu Ala Thr Pro Xaa  
130 135 140

Xaa Ala Pro Val Ala Val Leu Pro Ala Met Asn Gln Gln Met Tyr Arg  
145 150 155 160

Ala Ala Ala Thr Gln His Asn Leu Glu Val Leu Ala Xaa Ser Arg Gly  
165 170 175

Leu Leu Ile Trp Gly Pro Asp Ser Gly Ser Gln Ala Cys Gly Asp Ile  
180 185 190

Gly Pro Gly Arg Xaa Xaa Asp Pro Leu Thr Ile Val Asp Met Ala Val  
195 200 205

Ala His Phe Ser Pro Val Asn Asp Leu Lys His Leu Asn Ile Met Ile  
210 215 220

Thr Ala Gly Pro Thr Arg Glu Pro Leu Asp Pro Val Arg Tyr Ile Ser  
225 230 235 240

Asn His Ser Ser Gly Lys Met Gly Phe Ala Ile Ala Ala Ala Ala Ala  
245 250 255

Arg Arg Gly Ala Asn Val Thr Leu Val Ser Gly Pro Val Ser Leu Pro  
260 265 270

Thr Pro Pro Phe Val Lys Arg Val Asp Val Met Thr Ala Leu Glu Met  
275 280 285

Glu Ala Ala Val Asn Xaa Xaa Ala Ser Val Gln Gln Gln Asn Ile Phe  
290 295 300

Ile Gly Cys Ala Ala Val Ala Asp Tyr Arg Ala Ala Thr Val Ala Pro  
305 310 315 320

Glu Lys Ile Lys Lys Gln Ala Thr Gln Gly Asp Glu Leu Thr Ile Lys  
325 330 335

Met Val Lys Xaa Asn Pro Asp Ile Val Ala Gly Val Ala Ala Leu Lys  
340 345 350

Asp His Arg Pro Tyr Val Val Gly Phe Ala Ala Glu Thr Asn Asn Xaa  
355 360 365

Xaa Xaa Xaa Val Glu Glu Tyr Ala Arg Gln Lys Arg Ile Arg Lys Asn  
370 375 380

Leu Asp Leu Ile Cys Ala Asn Asp Val Ser Gln Pro Thr Gln Gly Phe  
385 390 395 400

Asn Ser Asp Asn Asn Ala Leu His Leu Phe Trp Gln Asp Gly Asp Lys  
405 410 415

Val Leu Pro Leu Glu Arg Lys Glu Leu Leu Gly Gln Leu Leu Leu Asp  
420 425 430

Glu Ile Val Thr Arg Tyr Asp Glu Lys Asn Arg Arg  
435 440

<210> 53

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC\_FEATURE

<222> (1)..(14)

<223> "X" represents any amino acid

<400> 53

Xaa Gly Xaa Xaa Asp Xaa Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa  
Page 29

1 5 10

<210> 54

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 54

Phe Ala Trp Val Asp Pro Gly Trp Asp Gly Asn Thr Leu Met  
1 5 10

<210> 55

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 55

Ala Gly Trp Ile Asp Ala Gly Phe Lys Gly Lys Ile Thr Leu  
1 5 10

<210> 56

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 56

Ser Ala Val His Asp Pro Gly Tyr Glu Gly Arg Pro Glu Tyr  
1 5 10

<210> 57

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 57

Pro Thr Ile Val Asp Ala Gly Phe Glu Gly Gln Leu Thr Ile  
Page 30

1 5 10

<210> 58

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 58

Ala His Arg Ile Asp Pro Gly Trp Ser Gly Cys Ile Val Leu  
1 5 10

<210> 59

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 59

gagttaaatg cctacactgt atct

24

<210> 60

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 60

caggactcag aagctgctat cgaa

24

<210> 61

<211> 24

<212> DNA

<213> Artificial Sequence



<220>

<223> synthetic

<400> 61

ctgcacgtgc cctgtaggat ttgt

24

<210> 62

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 62

ctattgagta cgaacgccat c

21

<210> 63

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 63

gtcacgcttg ctccactccg

20

<210> 64

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 64

gaggagagca ggaaaggtgg aac

23

<210> 65

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 65

gctgggagaa gacttcactg g

21

<210> 66

<211> 8

<212> PRT

<213> Pyrococcus furiosus

<400> 66

His His Val Lys Leu Ile Tyr Ala  
1 5

<210> 67

<211> 8

<212> PRT

<213> Pyrococcus furiosus

<400> 67

Lys Tyr Asp Ala Val Ile Met Ala  
1 5

<210> 68

<211> 7

<212> PRT

<213> Pyrococcus furiosus

<400> 68

Glu Glu Asn Gln Val Val Leu  
1 5

<210> 69

<211> 8

<212> PRT

<213> Pyrococcus furiosus

<400> 69

Pro Asp Trp Lys Ile Arg Lys Glu  
1 5

<210> 70

<211> 471

<212> DNA

<213> Pyrococcus furiosus

<400> 70

atgctacttc cagactggaa aatcagaaaa gaaataactta tagagccatt ttctgaagaa	60
tcgctccaac cagcagggtta tgacctcaga gtgggcagag aggcttttgt taaggggaaa	120
ttaatcgacg tggaagaggga aggaaaagtc gttattcctc caagggaata cgccttaatc	180
ctaaccctcg agaggataaa gttgcccga gatgttatgg gggatatgaa gataaggagc	240
agtttagcaa gagaaggggt tattggttct ttgcttggg ttgaccagg atgggatgga	300
aacttaacac taatgctcta caatgcctca aatgaacctg tcgaattaag atatggagag	360
agatttggtc agatcgcat tataaggcta gaggggccgg caagaaacc ttacagagga	420
aactatcagg ggagcacaag gttagcggtt tcaaagagaa agaaactcta g	471

<210> 71

<211> 156

<212> PRT

<213> Pyrococcus furiosus

<400> 71

Met Leu Leu Pro Asp Trp Lys Ile Arg Lys Glu Ile Leu Ile Glu Pro  
1 5 10 15

Phe Ser Glu Glu Ser Leu Gln Pro Ala Gly Tyr Asp Leu Arg Val Gly  
20 25 30

Arg Glu Ala Phe Val Lys Gly Lys Leu Ile Asp Val Glu Lys Glu Gly  
35 40 45

Lys Val Val Ile Pro Pro Arg Glu Tyr Ala Leu Ile Leu Thr Leu Glu  
50 55 60

Arg Ile Lys Leu Pro Asp Asp Val Met Gly Asp Met Lys Ile Arg Ser  
65 70 75 80

Ser Leu Ala Arg Glu Gly Val Ile Gly Ser Phe Ala Trp Val Asp Pro  
85 90 95

Gly Trp Asp Gly Asn Leu Thr Leu Met Leu Tyr Asn Ala Ser Asn Glu  
100 105 110

Pro Val Glu Leu Arg Tyr Gly Glu Arg Phe Val Gln Ile Ala Phe Ile  
115 120 125

Arg Leu Glu Gly Pro Ala Arg Asn Pro Tyr Arg Gly Asn Tyr Gln Gly  
130 135 140

Ser Thr Arg Leu Ala Phe Ser Lys Arg Lys Lys Leu  
145 150 155

<210> 72

<211> 13

<212> PRT

<213> uridine-binding motif

<220>

<221> MISC\_FEATURE

<222> (1)..(13)

<223> "X" represents any amino acid

<400> 72

Xaa Gly Xaa Xaa Asp Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa  
1 5 10

<210> 73

<211> 14

<212> PRT

<213> *Pyrococcus furiosus*

<400> 73

Phe Ala Trp Val Asp Pro Gly Trp Asp Gly Asn Thr Leu Met  
1 5 10

<210> 74

<211> 14

<212> PRT

<213> *Methanococcus jannaschii*

<400> 74

Ala Gly Trp Ile Asp Ala Gly Phe Lys Gly Lys Ile Thr Leu  
1 5 10

<210> 75

<211> 14

<212> PRT

<213> *Methanococcus jannaschii* put.

<400> 75

Ser Ala Val His Asp Pro Gly Tyr Glu Gly Arg Pro Glu Tyr  
1 5 10

<210> 76

<211> 14

<212> PRT

<213> *D. sulf.*

<400> 76

Pro Thr Ile Val Asp Ala Gly Phe Glu Gly Gln Leu Thr Ile  
1 5 10

<210> 77

<211> 14

<212> PRT

<213> Escherichia coli

<400> 77

Ala His Arg Ile Asp Pro Gly Trp Ser Gly Cys Ile Val Leu  
1 5 10

<210> 78

<211> 14

<212> PRT

<213> Escherichia coli

<400> 78

Val Gly Leu Ile Asp Ser Asp Tyr Gln Gly Gln Leu Met Ile  
1 5 10

<210> 79

<211> 14

<212> PRT

<213> Yeast

<400> 79

Ala Gly Val Val Asp Arg Asp Tyr Thr Gly Glu Val Lys Val  
1 5 10

<210> 80

<211> 14

<212> PRT

<213> Homo sapiens

<400> 80

Ala Gly Val Ile Asp Glu Asp Tyr Arg Gly Asn Val Gly Val  
1 5 10

<210> 81

<211> 14

<212> PRT

<213> Herpes virus

<400> 81

Thr Gly Leu Ile Asp Pro Gly Phe Gln Gly Glu Leu Lys Leu  
1 5 10

<210> 82

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 82

gacgacgaca agatgctact tccagactgg aaa

33

<210> 83

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 83

ggaacaagac ccgtcccact ttcacagatg aagag

35

<210> 84

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 84

gaggagagca ggaaaggtgg aac

23

<210> 85  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic  
<400> 85  
ctccatgtcc caactccgat cac

23

<210> 86  
<211> 38  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic  
<400> 86  
ggttttccca gtcacgacgt tgtaaaacga cggccagt

38

<210> 87  
<211> 38  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> synthetic  
<400> 87  
gguuuuuccca gucacgacgu uguaaaaacga cggccagu

38

<210> 88  
<211> 35  
<212> DNA  
<213> Artificial Sequence



<220>

<223> synthetic

<400> 88

gacgacgaca agatgccctg ctctgaagag acacc

35

<210> 89

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 89

ggaacaagac ccgtttaatt ctttccagtg gaacc

35